

REPLACED BY  
PCT/ST/PTO

PATENT COOPERATION TREATY 10/502473  
Rec'd PCT/PTO 23 JUL 2004

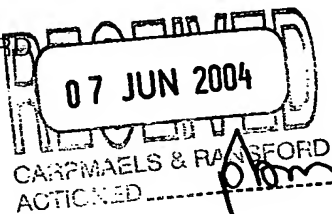
the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

see 6/11

PCT

To:

Cokerton, Bruce Roger  
CARPMAELS & RANSFORD  
43 Bloomsbury Square  
London WC1A 2RA  
GRANDE BRETAGNE



NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing  
(day/month/year)

08.06.2004

Applicant's or agent's file reference

P029466WE PF-0136

IMPORTANT NOTIFICATION

International application No.  
PCT/GB 03/00233

International filing date (day/month/year)  
21.01.2003

Priority date (day/month/year)  
25.01.2002

Applicant

DUPONT TEIJIN FILMS US. LIMITED PARTNERSHIP

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international  
preliminary examining authority:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016



Authorized Officer

Dekker, M

Tel. +31 70 340-4046



**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P029466WO</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. <b>PCT/GB 03/00233</b>	International filing date ( <i>day/month/year</i> ) <b>21.01.2003</b>	Priority date ( <i>day/month/year</i> ) <b>25.01.2002</b>
International Patent Classification (IPC) or both national classification and IPC <b>B32B1/08, B32B1/08</b>		
Applicant <b>DUPONT TEJIN FILMS US. LIMITED PARTNERSHIP</b>		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 7 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand  <b>21.08.2003</b>	Date of completion of this report  <b>08.06.2004</b>	
Name and mailing address of the international preliminary examining authority:   <b>European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016</b>	Authorized Officer  <b>Stinchcombe, J</b>  Telephone No. +31 70 340-3679  	

REPLACES  
ART 34 AND

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/00233

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

**Description, Pages**

1-32 as originally filed

**Claims, Numbers**

1-36 received on 29.04.2004 with letter of 28.04.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

REPLACED BY  
ART 34 AMDT

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/00233

---

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-36
	No: Claims	
Inventive step (IS)	Yes: Claims	1-36
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-36
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following document:

D1: US-A-2 762 720 (MICHEL RUDOLPH H) 11 September 1956 (1956-09-11)

**Closest prior art**

Document D1, which is considered to represent the most relevant state of the art, discloses a heat-sealable multilayer polymeric film comprising a shrinkable substrate layer of polymeric material having on a surface thereof a heat-sealable layer (PET layer with a coating of copolymer based on vinylidene chloride; see D1 col 1 lines 48-56) formed by a coating process (see D1 Examples 1-9). The PET layer of D1 (shrinkable layer) has degree of shrinkage values of 23-27% (cf. 0-50% in the application) in a first (machine) direction and of 39-46% (cf. 5-70% in the application) in a second orthogonal (transverse) direction measured at 80-90 °C (cf. application 55-100 °C) (see D1 Tables 1, 2 & 3). D1 also discloses the possibility of forming such a film into a tube (see D1 col 7 lines 7-21).

**Novelty**

D1 does not disclose that the multilayer film should comprise a plurality of separating means to enable one multilayer portion of the film to be separated from an adjacent multilayer portion of the film.

The subject-matter of claims 1, 24 & 26 is therefore new (Article 33(2) PCT).

**Inventive step**

The problem to be solved by the present invention may be regarded as how to provide a multilayer film tube for use in ready-cooked meal packaging more economically than is provided by existing packaging (which employs separate lidding and sleeve components).

The solution to this problem as proposed in claims 1, 24 & 26 of the present application is considered as involving an inventive step (Article 33(3) PCT). The use of a single, tube-shaped film having the dual function of sealing lid and sleeve, from which the sleeve can be removed prior to cooking by means of a plurality of separating means (e.g. perforations) solves the problem stated and is not obvious starting out from the teaching of D1, when D1 is considered alone or in combination with any other prior art

REPLACED BY  
ART 34 AMDT

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/GB 03/00233

document.

Claims 2-23, 25 and 27-36 are dependent on claims 1, 24 & 26 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**Industrial applicability**

The subject-matter of the application is susceptible of industrial application.

CLAIMS

1. An open-ended tube comprising walls of a heat-sealable multi-layer polymeric film, wherein said film comprises an outer shrinkable substrate layer and an inner heat-sealable layer, wherein said substrate layer has a degree of shrinkage in the longitudinal dimension of the tube of about 0% to about 50% over the temperature range 55 to 100°C, and a degree of shrinkage in the transverse dimension of the tube of about 5 to about 70 % over the temperature range 55 to 100°C.
2. A tube according to claim 1 wherein the ratio of shrinkage at 100°C in the transverse dimension relative to that in the longitudinal dimension is in the range from 1:1 to 10:1.
3. A tube according to any preceding claim wherein the ratio of shrinkage at 100°C in the transverse dimension to that in the longitudinal dimension is greater than 1:1.
4. A tube according to any preceding claim wherein the substrate layer has a degree of shrinkage in the longitudinal dimension of the tube of about 0% to about 10% over the temperature range 55 to 100°C, and a degree of shrinkage in the transverse dimension of the tube of about 5% to about 20% over the temperature range 55 to 100°C.
5. A tube according to any preceding claim wherein the substrate comprises polyester.
6. A tube according to any preceding claim wherein the substrate comprises poly(ethylene terephthalate) or a copolyester in which the major repeat unit is ethylene terephthalate.
7. A tube according to any of claims 1 to 5 wherein the substrate layer comprises a copolyester of terephthalic acid (TPA) and isophthalic acid (IPA) with one or more diols selected from the group consisting of aliphatic and cycloaliphatic diols wherein the molar ratios of the isophthalate polyester units to the terephthalate

polyester units are from 1 to 40 mol % isophthalate and from 99 to 60 mol % terephthalate.

8. A tube according to claim 7 wherein said diol is ethylene glycol.

9. A tube according to claim 7 or 8 wherein the substrate layer comprises a copolyester comprising substantially 18 mol % ethylene isophthalate and 82 mol % ethylene terephthalate.

10. A tube according to any preceding claim wherein the substrate comprises two or three discrete layers.

11. A tube according to claim 10 wherein said two layer substrate comprises a first layer A and a second layer B, wherein the polymer of the layer B comprises a copolyester as set out in any of claims 7 to 9, and the polymer of the layer A comprises a copolyester of terephthalic acid with two or more aliphatic glycols, and wherein the layer A is disposed in contact with the heat-sealable layer.

12. A tube according to claim 10 wherein said three layer substrate comprises an ABA structure, wherein the polymer of the layer B comprises a copolyester as set out in any of claims 7 to 9, and the polymer of the layer A comprises a copolyester of terephthalic acid with two or more aliphatic glycols

13. A tube according to claim 11 or 12 wherein the aliphatic glycols of the copolyester of the layer(s) A are ethylene glycol and 1,4-cyclohexane dimethanol.

14. A tube according to claim 13 wherein the copolyester of the layer(s) A is a copolyester having about 30-35 mole % 1,4-cyclohexane dimethanol and about 65-70 mole %.

15. A tube according to any preceding claim wherein the heat-sealable layer comprises a copolyester of an aromatic dicarboxylic acid, an aliphatic dicarboxylic acid and a glycol.



16. A tube according to claim 15 wherein said copolyester of the heat-sealable layer comprises terephthalic acid, sebacic acid and butylene glycol.
- 5 17. A tube according to claim 16 wherein said copolyester is a copolyester of butylene glycol with about 50% terephthalic acid and about 50% sebacic acid.
18. A tube according to any preceding claim wherein said film further comprises a printable or ink-receiving layer disposed on the surface of the substrate opposite to  
10 the surface which is in contact with the heat-sealable layer.
19. A tube according to claim 18 wherein the printable or ink-receiving layer polymer is an acrylic and/or methacrylic polymeric resin.
- 15 20. A tube according to claim 18 wherein the printable or ink-receiving layer polymer comprises about 35 to 60 mole % ethyl acrylate, about 30 to 55 mole % methyl methacrylate and about 2 to 20 mole % methacrylamide.
21. A tube according to any preceding claim wherein said heat-sealable multi-layer  
20 film is peelable.
22. A tube according to any preceding claim wherein said multi-layer film comprises a plurality of separating means which enable one multi-layer portion of said film to be separated from an adjacent multi-layer portion of said film, each separating  
25 means comprising one or two sets of perforations extending along a dimension of the tube which is substantially parallel to its longitudinal dimension.
23. A tube according to claim 22 wherein there are two separating means.
- 30 24. A heat-sealable multi-layer polymeric film comprising a shrinkable substrate layer of polymeric material having on a surface thereof a heat-sealable layer, wherein said shrinkable substrate layer has a degree of shrinkage in a first dimension of about 0% to about 50% over the temperature range 55 to 100°C, and a degree of

shrinkage in a second orthogonal dimension of about 5 to about 70% over the temperature range 55 to 100°C, with the proviso that the heat-sealable multi-layer polymeric film does not comprise a further shrinkable layer laminated to said shrinkable substrate layer.

5

25. A film according to claim 24 wherein said film is as defined in any of claims 1 to 23.

26. A process for the production of the multi-layer polymeric film of claim 24 or 25 which comprises the steps of:

10

(i) forming a polymeric film substrate having a degree of shrinkage in one dimension of about 0% to about 50% over the temperature range 55 to 100°C, and a degree of shrinkage in the other dimension of about 5 to about 70 % over the temperature range 55 to 100°C;

15

(ii) providing a heat-sealable layer on a first surface of said polymeric film substrate wherein said heat-sealable layer is provided by coextrusion of the respective film-forming polymeric materials of the substrate and heat-sealable layers or by coating a surface of the substrate with the polymeric material of the heat-sealable layer;

20

(iii) optionally providing a printable or ink-receiving layer on the surface of the substrate opposite to the surface which is in contact with the heat-sealable layer, and optionally printing onto said printable or ink-receiving layer; and

(iv) optionally incorporating a plurality of separating means in the film.

25 27. A process for the production of an open-ended tube comprising multi-layer polymeric film walls, as defined in any of claims 1 to 23, which comprises steps (i) to (iv) of claim 26 and further comprising:

(v) forming an open-ended tube by sealing one end portion of the film to the other end portion of the film.

30

28. A process according to claim 26 or 27 wherein steps (i) and (ii) are effected by a process comprising an in-line or off-line coating technique in the formation of said heat-sealable layer.

29. A process according to claim 26 or 27 wherein steps (i) and (ii) are effected by a melt-coating process comprising the steps of:

- (a) melt-extruding said substrate layer of polymeric material;
- (b) stretching said substrate in a first direction;
- (c) optionally stretching said substrate in a second orthogonal direction;
- (d) optionally heat-setting the stretched film;
- (e) forming a heat-sealable coating layer on a surface of the substrate by melt-coating directly thereon a molten polymeric material; and
- (f) cooling the coated substrate,

wherein coating step (e) is prior to step (b) or between steps (b) and (c).

30. A method of sealing a container suitable for use as a receptacle for ready prepared convenience foods, said method comprising the steps of:

- (i) forming a polymeric film substrate having a degree of shrinkage in one dimension of about 0% to about 50% over the temperature range 55 to 100°C, and a degree of shrinkage in the other dimension of about 5 to about 70 % over the temperature range 55 to 100°C;
- (ii) providing a heat-sealable layer on a first surface of said polymeric film substrate wherein said heat-sealable layer is provided by coextrusion of the respective film-forming polymeric materials of the substrate and heat-sealable layers or by coating a surface of the substrate with the polymeric material of the heat-sealable layer;
- (iii) optionally providing a printable or ink-receiving layer on the surface of the substrate opposite to the surface which is in contact with the heat-sealable layer, and optionally printing onto said printable or ink-receiving layer;
- (iv) optionally incorporating a plurality of separating means in the film;
- (v) positioning said multi-layer polymeric film over or around the container, such that said heat-sealable layer of the film is in contact with the container, and such that where said separating means are present the portion of the film which is contacted with the container is the portion of the film which is between two of said separating means;

- 5
- (vi) effecting a seal between the film and the surfaces of the container which define the open end of the container, thereby defining a "lid portion" of the film;
  - (vii) forming an open-ended tube by sealing one end portion of the film to the other end portion of the film, such that the container is positioned within the tube; and
  - (viii) exposing the container and sealed tube to heat in order to effect shrinkage of the tube, such that the tube fits closely and securely around the container.

10 31. A method according to claim 30 wherein step (vii) is conducted before steps (v) and (vi).

15 32. A process or method according to any of claims 26 to 31 wherein each separating means comprises one or two sets of perforations extending along a dimension of the tube which is substantially parallel to its longitudinal dimension.

33. A process or method according to any of claims 26 to 32 wherein the components of the multi-layer polymeric film are as set out in any of claims 1 to 23.

20 34. A sealed container comprising a receptacle containing food or drink, and a packaging sleeve formed from a polymeric tube as defined in any of claims 1 to 23.

25 35. A sealed container according to claim 34, wherein the packaging sleeve comprises a lid portion which forms a seal over the open end of the container, and a base portion which surrounds opposing sides and the underside of the container, wherein the base portion and the lid portion are separated by, and separable by virtue of, two separating means, wherein each separating means comprises one or two sets of perforations extending along a dimension of the sleeve which is substantially parallel to its longitudinal dimension.

30

36. The use of the film described in claim 24 or 25 in the manufacture of packaging for a container suitable as a receptacle for a ready-prepared ovenable meal, wherein said packaging is in the form of an open-ended tube or sleeve within which is

FILED  
APR 34 1957

WO 03/061957

PCT/GB03/00233

39

disposed the container, and wherein a first portion of said packaging seals said container, and where a second portion of said packaging is separable from said first portion prior to the cooking cycle of said ovenable meal.